

Enclosure 2

State of California Information to Support Recommendations for Federal PM2.5 Nonattainment Area Boundaries

This document discusses our rationale for the recommended boundaries for each of the four preliminary fine particulate matter (PM2.5) nonattainment areas in California. The U.S. Environmental Protection Agency's (U.S. EPA) guidance memorandum (*April 1, 2003, Designations for the Fine Particle National Ambient Air Quality Standards, Memorandum from Jeffrey R. Holmstead, Assistant Administrator, Office of Air and Radiation to Regional Administrators, Regions I-X*) sets out criteria for determining appropriate nonattainment area boundaries. In short, the memorandum indicates that nonattainment areas must be large enough to capture the entire area violating the standard as well as sources contributing to violations.

The guidance goes on to describe the association of higher PM2.5 levels with greater levels of urban activity and states that the presumptive boundaries for urbanized areas violating the PM2.5 standards is the Metropolitan Statistical Area (or Consolidated Metropolitan Statistical Area where appropriate.) U.S. EPA's guidance also suggests consideration of eight-hour nonattainment boundaries to support coordination of control strategies for ozone and PM2.5. For U.S. EPA to consider an alternative boundary, the memorandum calls on states to evaluate the following criteria to support its recommendations for the geographic extent of a nonattainment area.

- Emissions
- Population density
- Expected growth
- Geography/topography
- Level of emission control
- Air quality
- Traffic and commuting patterns
- Meteorology
- Jurisdictional boundaries

In California, the primary considerations for air quality planning are air basin and air district boundaries if the pollution problem is regional in nature. Under State law, air basins are based on a rigorous scientific assessment of geography and meteorology, with consideration of political jurisdictions. Basin boundaries are formally adopted by ARB in regulation. Air districts were established by State statute. ARB typically uses a combination of air basin and air district lines to set boundaries for areas that violate California air quality standards, with exceptions when a single city or community has a unique air pollution problem distinct from the region.

We evaluated the specific criteria in U.S. EPA guidance, as well as State conventions, to identify the most appropriate and effective boundary for each PM2.5 nonattainment area. We recommend the air basin boundaries for South Coast, San Joaquin Valley, and San Diego to reflect the regional nature of PM2.5 pollution in these areas. We

recommend a focused nonattainment area for the City of Calexico to reflect the localized nature of the PM2.5 problem there.

South Coast Air Basin

The federal PM2.5 standards are exceeded broadly across the basin. Consideration of U.S. EPA's factors, especially population and emission densities within the basin, which indicate broad regional contribution to elevated PM2.5 levels, support use of the air basin boundary.

The recommended South Coast Air Basin PM2.5 nonattainment area includes Western Los Angeles (including Catalina and San Clemente Islands), Orange, Southwestern San Bernardino, and Western Riverside Counties. This area is under the jurisdiction of the South Coast Air Quality Management District. The recommended boundary corresponds to the recently modified federal one-hour ozone nonattainment boundary and the proposed eight-hour ozone boundary.

San Joaquin Valley Air Basin

The federal PM2.5 standards are exceeded broadly across the basin. Consideration of U.S. EPA's factors, especially population and emission densities within the basin, which indicate broad regional contribution to elevated PM2.5 levels, support use of the air basin boundary.

The recommended San Joaquin Valley PM2.5 nonattainment area consists of San Joaquin, Stanislaus, Merced, Madera, Fresno, Kings, Tulare and Western Kern Counties. The area is under the jurisdiction of the San Joaquin Valley Unified Air Pollution Control District. The recommended boundary for this area coincides with the existing federal one-hour ozone nonattainment boundary and ARB's proposed eight-hour ozone boundary.

San Diego County

The federal annual PM2.5 standard is exceeded broadly across the basin. Consideration of U.S. EPA's factors, especially population and emission densities within the basin, which indicate broad regional contribution to elevated PM2.5 levels, support use of the County boundary, which is the same as the air basin boundary.

The proposed PM2.5 nonattainment area would include all of San Diego County, under the jurisdiction of the San Diego Air Pollution Control District. This corresponds to the existing federal one-hour ozone maintenance area boundary and the proposed eight-hour ozone boundary.

City of Calexico

The City of Calexico is on the U.S-Mexico border, at the southern end of Imperial County. The County is under the jurisdiction of the Imperial County Air Pollution Control District and is part of the Salton Sea Air Basin (which also includes a portion of Riverside County). Imperial County is generally rural with relatively small incorporated regions -- only El Centro is included in a Metropolitan Statistical Area.

Imperial County is a federal PM10 nonattainment area, with peak PM10 levels occurring in Calexico and occasional PM10 exceedances elsewhere in the County (exacerbated by transport from Mexico). Within Imperial County, Calexico is just over the annual PM2.5 standard for 2000-2002, while monitors in the Brawley and El Centro record levels significantly below this standard. None of the Imperial County monitors have recorded violations of the 24-hour PM2.5 standards. Data from the portion of Riverside County in the basin show attainment of both PM2.5 standards.

Based on the available information, we believe that violations of the PM2.5 standard are localized in Calexico and the much larger adjacent city of Mexicali, Mexico. As a result, the federal PM2.5 nonattainment area should be limited to the part of this urban area on the U.S. side of the border -- the City of Calexico.

We discuss this recommendation in the context of U.S. EPA's boundary criteria below, specifically the basis for recommending a nonattainment area smaller than the full Imperial County. The Calexico/Mexicali urban area is easily distinguished from the rest of Imperial County. Since current emission statistics for Mexicali are not readily available, we relied on a 1999 report *Program to Improve Air Quality in Mexicali 2000-2005* that was developed by the Mexican government and posted on U.S. EPA's website. We then compared data for the appropriate corresponding year in Calexico and Imperial County.

Population Density From an air quality perspective, Calexico and Mexicali, Mexico form one urbanized region divided by an international border. According to 2000 U.S. Census data, Calexico's population is approximately 27,000. The official 2000 Mexican Census placed Mexicali's population at 760,000, with 3 percent annual growth expected. In 2000, the entire Imperial County population was 142,000. Considering the geographic size of the two areas as well, the Mexicali population density is two and a half times the density for all of Imperial County.

Air Quality We calculate that the high PM10 site in Mexicali exceeded the level of the U.S. federal PM10 standard on 258 days in 2001. During the same year in Imperial County, there were 18 calculated exceedances at the Calexico high monitor, zero days at Brawley, and 6-7 days at El Centro, Niland, and Westmorland.

Chemical mass balance speciated data indicate Calexico PM2.5 is dominated by organic carbon particles. They are a significant contributor to elevated PM2.5 levels throughout the year, peaking during the winter months. On an annual basis, these

carbon particles make up approximately 60 percent of total PM_{2.5} mass. Organic carbon sources in urban areas include burning, cooking, and motor vehicle exhaust. Geologic material (dust) is a smaller portion of total PM_{2.5} in Calexico, making up less than 20 percent of total PM_{2.5} mass on an annual average basis.

Emissions Calexico (and Mexicali) are distinct from the rest of Imperial County based on the distribution and nature of emission sources. Imperial County is largely rural with widespread agricultural activity and the associated emissions profile. Urban activities and their associated emissions are found only in the few developed areas: Calexico (and Mexicali), El Centro, City of Imperial, and Brawley. The Mexicali inventory for oxides of nitrogen (NO_x) is about 30 percent greater than all of Imperial County's. The Mexicali hydrocarbon (HC) inventory is about 60 percent greater than all of Imperial County's. Finally, the urban Mexicali direct PM₁₀ inventory is nearly the same as Imperial County's.

Traffic and Commuting Patterns Calexico/Mexicali is home to a busy U.S.-Mexico border crossing. In 1996, the border crossing handled almost 7 million vehicles. Mexicali has over three times as many motor vehicles as all of Imperial County.

Level of Control Imperial County has motor vehicle emission controls that are consistent with the rest of California. Vehicles must meet California standards; both cars and heavy trucks are subject to in-use inspection programs. The Imperial County District administers a smoke management program for open burning, consistent with the ARB's statewide regulation. Vehicles in Mexicali are typically older California vehicles and there is no in-use inspection program. Finally, Mexicali open burning is widespread and uncontrolled. This is particularly significant given the large organic fraction found in Calexico PM_{2.5}.

The table below summarizes how all of Imperial County compares to Mexicali.

Imperial County/Mexicali Statistical Comparison

	Imperial County (entire county)	Mexicali (city only)
2000-Population	142,000	760,000
Population Density*	20 inhabitants/km ²	50 inhabitants/km ²
2001-days of PM ₁₀ over 150 ug/m ³ at high monitor	18 days @ Calexico Ethel	258 days at Mexicali Progreso
1996 NO _x Emissions*	35 tons per day	51 tons per day
1996 HC Emissions*	54 tons per day	140 tons per day
1996 PM ₁₀ Emissions*	220 tons per day	195 tons per day
Vehicle Population*	71,000	241,000

*Source: *Program to Improve Air Quality in Mexicali 2000-2005*

Based on all of these factors, ARB staff has concluded that Calexico exceedances of the federal PM_{2.5} standards are the result of urban activity associated with the densely populated international Calexico/Mexicali border region. Within Imperial County, the level of urban activity is unique to the area and is not representative of the air quality of the rest of Imperial County or the Salton Sea Air Basin.